Henry's Fork Water Supply

Mid-water year review and spring/summer predictions

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April 10, 2026

It is hard to believe, but water year 2026 is half over, which means we can now assess key hydrologic indicators for the past six months and predict water supply and water quality for the upcoming spring and summer season. Most of the information in this report was previously provided in my daily reports.

Summary

- Mean October–March temperature was 5.6°F above average and 2.0° warmer than 2015, which was second warmest in the 1989–2026 record.
- Natural flow between Henry's Lake and Island Park Dam was 4.5% higher over the winter than I predicted on October 1, due to much of the winter's precipitation falling as rain instead of snow.
- Winter flow out of Island Park Dam averaged 215 cfs, compared with the 1989–2025 average of 349 cfs and an expectation of 170 cfs based on water supply.
- Snow water equivalent (SWE) peaked on March 16, 27 days earlier than average, at 67% of average, 3rd lowest on record.
- Natural streamflow is predicted to be the lowest in the 1978–2026 record and 62% of the 2001–2025 average: 67% in upper Henry's Fork, 65% in Fall River, and 60% in Teton River.
- Watershed natural flow is expected to peak in late May, around 2–3 weeks earlier than average.
- Island Park Reservoir will fill in early May, but draft is expected to start before June 9. Outflow could reach 1,200 cfs by mid-June.
- End-of-season reservoir volume is predicted to be 12,279 ac-ft (9% full), which would be 6th lowest on record but still higher than expected based on water supply.
- Turbidity, water temperature, and sediment load at Island Park Dam have a high probability of being the highest since we started monitoring in 2014, with onset of high turbidity in mid-June.
- We expect no acute effects of this year's low water supply on fish populations, but high reservoir draft and subsequent low winter flow will result in decreased populations in the river reaches immediately upstream and downstream of Island Park Reservoir 2–4 years from now.

Climate

The six-month period from October 1 to March 31 was warmest on record over most of the western U.S., including the Snake River headwaters. In the 38-year record I use in the Henry's Fork watershed, mean temperature for the first six months of the water year was 5.6°F above average and 2.0° warmer than 2015, which was second warmest in that record. In a nationwide record that goes back 132 years, the first six months of the water year were warmest on record over nearly half of the conterminous U.S., a broad swath of the country extending from Montana southeastward to portions of Missouri, Arkansas, and Texas. The region included eastern Oregon, eastern Idaho and all of Nevada, Utah, Wyoming, Colorado, Arizona and New Mexico. Over this region, temperatures over the past six months were 6–9°F above average.

Here in the Henry's Fork watershed, water-year total precipitation through the end of March was 93% of average, but because of warm temperatures, much of that fell as rain instead of snow. In addition, the snow that did fall began melting in mid-March during a record-setting heat wave. Snow water equivalent (SWE) peaked at the watershed scale on March 16, 27 days earlier than average, and 4th earliest in the record. Peak SWE this year was 67% of average, ranking 3rd lowest. The only year with a lower and earlier peak SWE was 2015, but rapid melt of this year's snowpack left the 2026 SWE as lowest on record for April 1 by over 1 inch. Net change in SWE over the month of March was a loss of 3.0 inches, compared with an average *gain* of 4.4 inches for the month.

Winter Streamflow and Water Management

Rain and early snowmelt contributed to higher-than-expected natural flow throughout the watershed during the fall and winter. Due to very dry and warm conditions last summer, natural flow started out the new water year at around 80% of average. However, by March 31, water-year accumulated natural flow was 94% of average: 86% in upper Henry's Fork, 105% in Fall River, and 104% in Teton River. Based on October 1 conditions, I predicted average natural flow between Henry's Lake and Island Park at 342 cfs, but the observed value turned out to be around 4.5% higher, at 358 cfs (Figure 1).

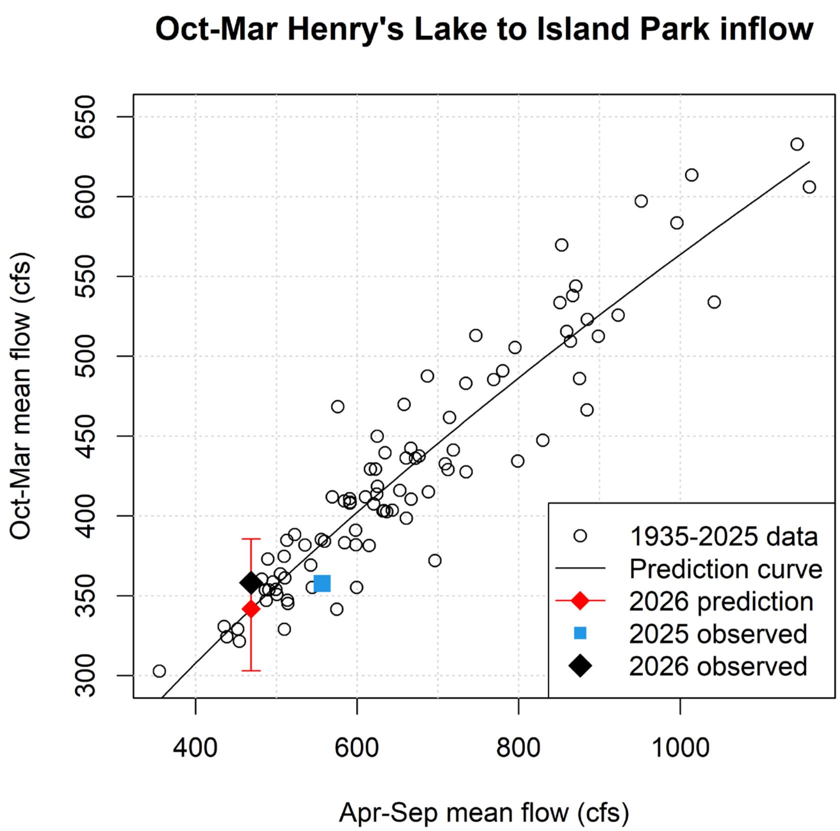

***Figure 1**. Predicted and observed natural watershed inflow between Henry's Lake and Island Park.*

The somewhat higher-than-expected inflow to Island Park Reservoir allowed higher-than-expected outflow over the winter (Figure 2). Over the three-month December–February period critical for juvenile

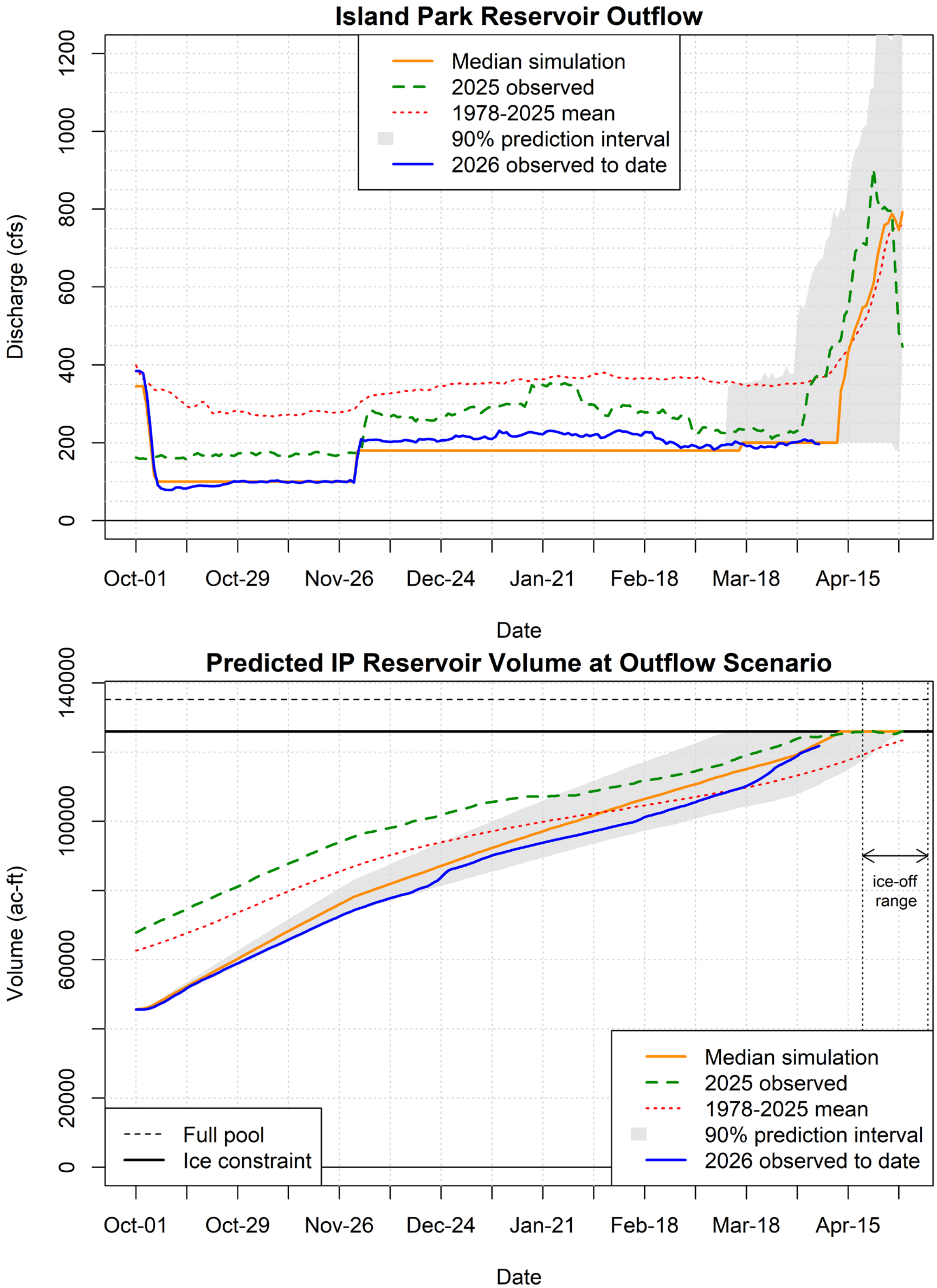

Figure 2*. Predicted and observed Island Park Reservoir outflow (top) and volume (bottom).*

trout survival downstream of Island Park Dam, flow out of the dam averaged 215 cfs, compared with the 1989–2025 average of 349 cfs. Streamflow through Box Canyon was 399 cfs, compared with an average of 556 cfs. The Box Canyon figure ranked 30th out of the last 38 water years. Winter outflow from Island Park Dam has averaged 296 cfs over the 93 years since it was built, so this year's value came in at 73% of the long-term average. Winter outflow was generally lowest over the first 30 years of the dam's history, when the reservoir was filled by essentially shutting off outflow for several months starting in mid-November. Operations changed in the early 1970s to allow higher winter outflows to benefit hydroelectric production downstream at Ashton, St. Anthony, and Idaho Falls, and the consistently highest winter outflows occurred in the 1970s through 1990s, when this operational regime coincided with the years of highest water supply in the 93-year record.

While below average—whether relative to the modern record or the dam's full 93-year history—this year's winter flow of 215 cfs was 45 cfs higher than expected based on last year's below-average water supply. This is the 8th consecutive year in which winter flow has exceeded expectations based on the strong statistical relationship between winter flow and water supply over the previous water year (Figure 3). Over the past eight years, winter flow has averaged 93 cfs higher than expected based on water supply, an increase worth around 465 additional rainbow trout added to the population each year. The winter flow increase is due to a combination of year-round water management changes implemented by Fremont-Madison Irrigation District and U.S. Bureau of Reclamation, with technical input from HFF and strategic concurrence from the Henry's Fork Drought Management Planning Committee. Over those eight years of improved winter flow, the highest improvements have come in the years of highest water supply, when the combination of increased reservoir carryover and better reservoir inflow produce a multiplicative effect. Improvement is lower during years such as 2026 when the opposite is true.

Even with slightly better-than-expected stream inflow, reservoir fill lagged expectations nearly all winter due to high evaporation rates in the fall prior to reservoir ice formation, and to below-average precipitation falling directly on the reservoir surface. However, the combination of heavy precipitation in December and early snowmelt in March resulted in reservoir volume finally reaching the October-1 prediction by April 1 (Figure 2). The data depicted in figures 1 and 2 show that October-1 predictions continue to be very accurate and useful in predicting winter operation of the reservoir.

Spring and Summer Predictions

I first developed a set of computer models to predict water supply and irrigation-system operations in 2017. Since then, the water supply predictions have been very accurate, with an average error of a little over 10%. The predictions have been generally biased a high, but I have incorporated several changes over the past few years to reduce that bias. The operations model is less accurate and has much higher uncertainty because system operations include a lot of human implementation and decision-making that are difficult to incorporate into computer code. That said, the model has performed well over the past nine years in providing general predictions for reservoir draft and regulated streamflow throughout the watershed.

The biggest source of uncertainty in applying the model to the spring and summer of 2026 comes from the fact that there is no year in the complete record of streamflow, reservoir, and diversion data that looks like 2026. From long-term records, the closest analog year is 1934, which was before construction

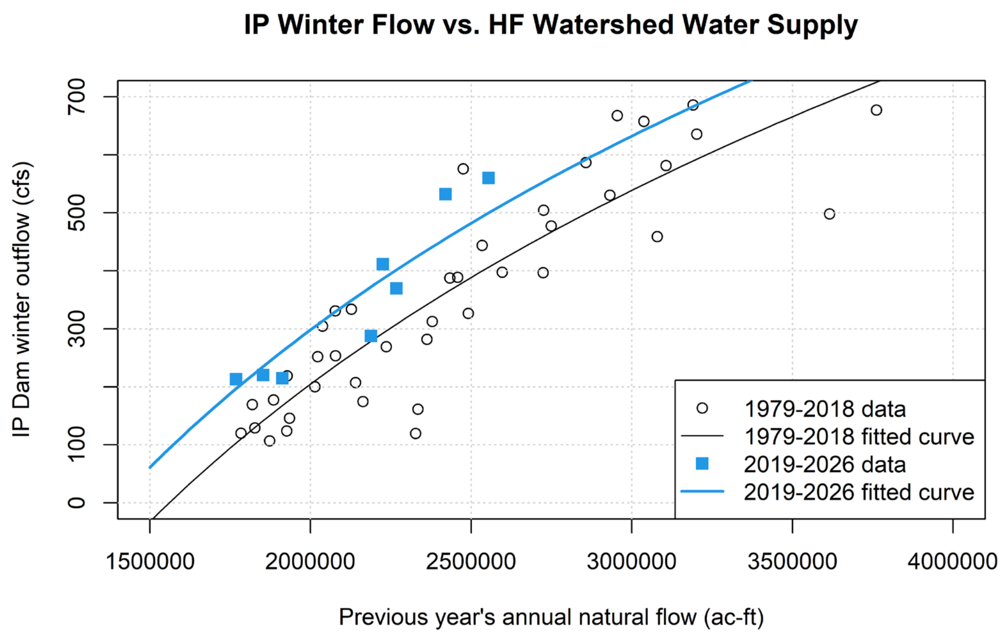

Figure 3*. Island Park Dam winter outflow vs. the previous year's natural flow, showing pre- and post-precision management relationships. The vertical distance between the blue and black curves is the average improvement in winter flow since precision water management was first implemented.*

of Grassy Lake, Island Park Reservoir and the Crosscut Canal and decades prior to digital records of water-rights accounting and diversion, let alone modern irrigation infrastructure. As a result, the statistical relationships used in the model are operating at the very margins of the data set. Further, decisions made by individual farmers, irrigation entities, and system-wide water managers are likely to have a bigger effect this year because of the unprecedented hydrologic conditions.

With those caveats, I made the following operational assumptions to account for low water supply. The water managers and water users who ultimately make operational decisions may choose different actions.

- Island Park Reservoir will not be drafted prior to May 8, even if typical early-season diversion rates cannot be otherwise met.
- Teton exchange well pumping is set to a minimum of 30,000 ac-ft over the period June 1 to September 15, with additional pumping if the Crosscut Canal capacity is exceeded.
- Delivery of 80 cfs from Henry's Lake will begin June 1 instead of later in the summer as is customary.
- Grassy Lake is drafted to 7,000 ac-ft, vs. an average of 11,000 ac-ft and 9,000 ac-ft last year.
- The lower Henry's Fork streamflow target is set at 300 cfs instead of the 350 cfs used in recent years.
- The lower Henry's Fork target is increased to 525 cfs August 1 through September 30 to send water from Henry's Fork reservoirs to American Falls.

I also used the only two years in which natural streamflow in the upper Henry's Fork watershed peaked on or before April 1 as analogs for upper Henry's Fork hydrograph shape, namely 2004 and 2015. Using any other years as potential analogs produced a mid- to late-April peak in inflow, which is extremely unlikely to occur.

Natural streamflow predictions

April–September natural streamflow for the whole watershed is predicted to be 62% of the 2001–2025 average: 67% in upper Henry's Fork, 65% in Fall River, and 60% in Teton River (Table 1). The watershed, upper Henry's Fork and Fall River values will be lowest in the 1978–2026 record. The Teton River figure would be second lowest to 2001. When compared with the wetter 1978–2000 period, the predicted values are on the order of 50–55% of average. In the worst-case scenario, which is the 10th percentile of the predictions (90% exceedance), this year's watershed-wide natural flow will be 55% of even the lower 2001-2025 average.

***Table 1**. Predictions for 2026 mean April 1–September 30 streamflow in the Henry's Fork watershed.*

	Mean April 1 – September 30 natural flow							
	2026 Prediction			90% Exceedance (10^{th} percentile)			2025 Observation	
Subwatershed	cfs	%1978-2000 ave.	% 2001-2025 ave.	cfs	%2001-2025 ave.	2001-2026 rank	cfs	%2001-2025 ave.
Henrys Lake	20	27%	39%	11	21%	26/26	23	46%
HL to Island Park	419	53%	72%	378	65%	26/26	469	81%
IP to Ashton	681	56%	69%	618	63%	26/26	778	78%
Upper HF (Ashton)	1094	52%	67%	1000	61%	26/26	1270	78%
Fall River	815	55%	65%	720	57%	26/26	1071	86%
Teton River	664	52%	60%	541	49%	26/26	925	83%
WATERSHED TOTAL	2492	51%	62%	2197	55%	26/26	3266	82%

Incorporating the full range of statistical uncertainty, the only year since 1978 that has a good chance of still having a lower water supply than this year is 2001 (Figure 4). Other years that sit right at the top end of the statistical prediction interval around this year's prediction are 1992, 2021, and 2015. With a very wet spring and summer, this year's water supply could end up slightly ahead of these three.

In the 93-year record of natural flow in the subwatershed between Henry's Lake and Island Park, this year's predicted natural flow value would rank second lowest only to 1934 (Figure 5). Even incorporating statistical uncertainty, it is unlikely that this year's natural flow will be as low as that in 1934. Further, numerous years fall within the statistical prediction interval around this year's estimate, including 1941, 1961, 2010, 2015, 2016, 2021, 2022, and 2025. Thus, while watershed-total natural flow is very likely to be lowest in the modern record at the watershed scale, it is likely that the Henry's Lake to Island Park value will be no lower than what we are now accustomed to seeing in that subwatershed on a regular basis. The reason for the difference is reliance of Fall River and Teton River streamflow on snowpack, which was lowest on record for April 1. The upper Henry's Fork is fed by groundwater springs, which integrate snowpack over previous years and thus aren't as sensitive to a single year with low snowpack.

As for timing, 2026 has already set records for earliest and lowest one-day streamflow peak in the upper Henry's Fork subwatershed. In the 93-year record for the Henry's Lake to Island Park reach of the river, the one-day peak in 2026 was 533 cfs, on March 24, compared with an average of 1402 cfs on May 7. This year's peak broke the old record of 578 cfs on April 1, set in 2015 (Figure 6). In the 97-year record for the

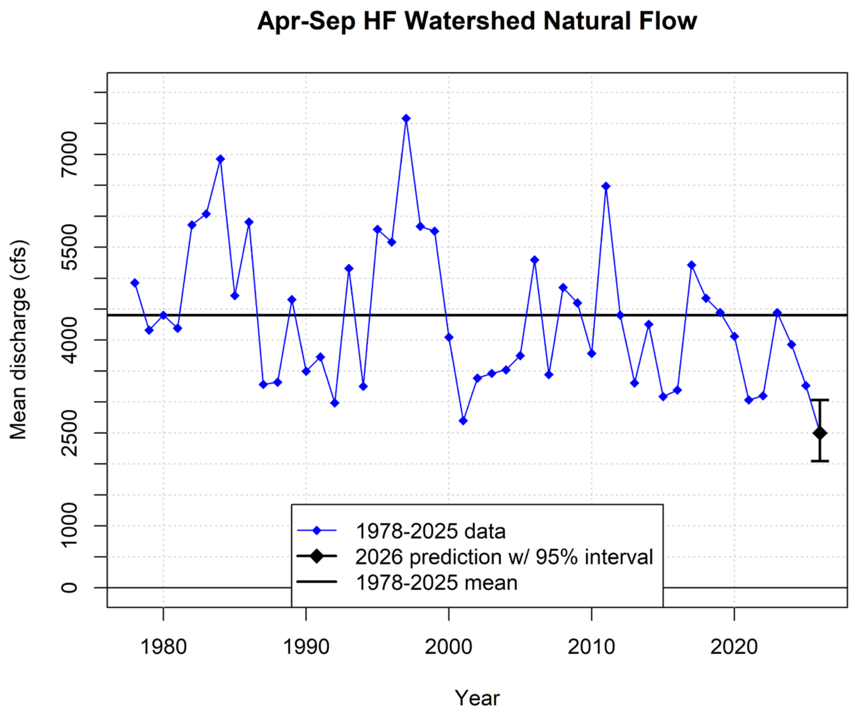

***Figure 4**. April–September natural flow in the Henry's Fork watershed from 1978–2025, with the 2026 prediction and 95% prediction interval.*

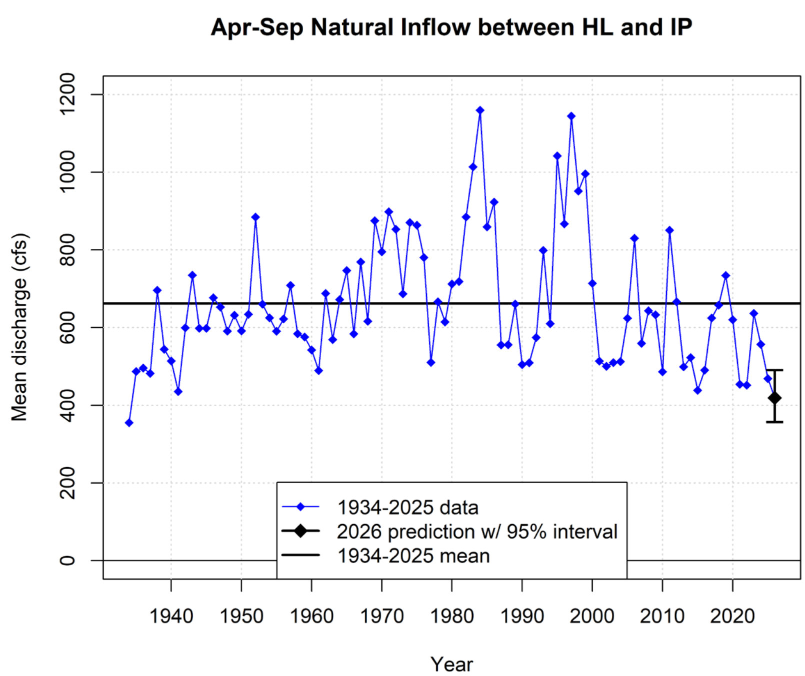

***Figure 5**. April–September natural flow between Henry's Lake and Island Park from 1934–2025, with the 2026 prediction and 95% prediction interval.*

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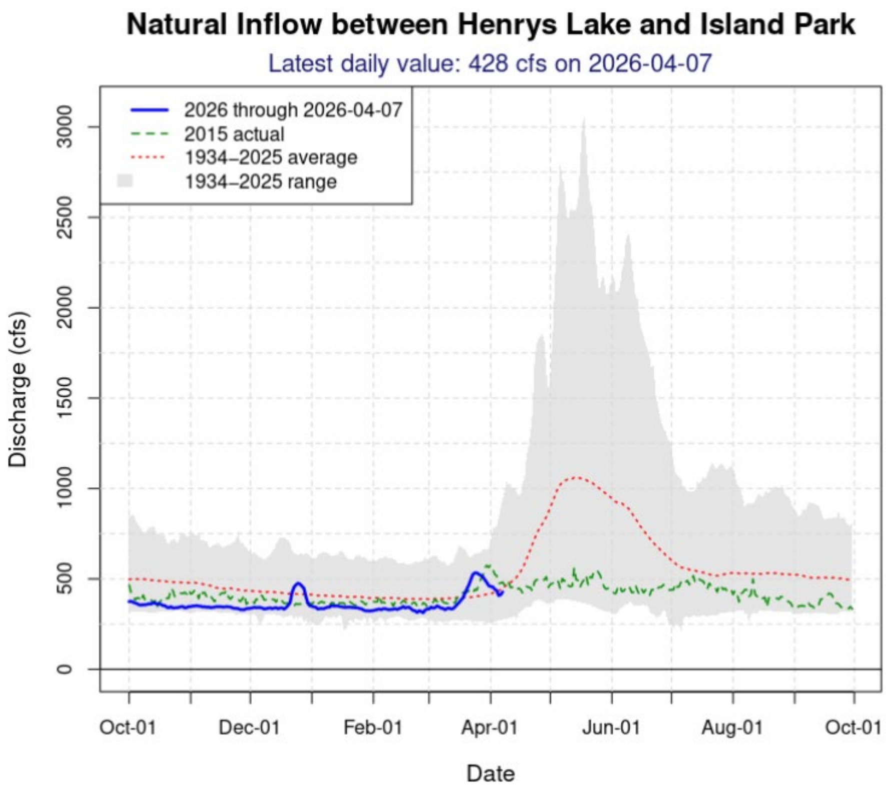

***Figure 6**. Natural watershed inflow between Henry's Lake and Island Park Reservoir, showing 2026 to date, 2015, and the 1934–2025 average.*

watershed between Henry's Lake and Ashton, this year's peak flow was 1360 cfs, on March 25, compared with an average of 3322 cfs on May 8. The previous record low peak magnitude was 1395 cfs, set in 1934, while the previous record peak date was March 25, in 2015.

In the other subwatersheds, runoff timing, as measured by hydrograph center of mass, is predicted to be 17 days earlier than average at Henry's Lake, 6 days earlier in Fall River, and 5 days earlier in Teton River (Table 2). The Henry's Lake value would set a new record for earliest runoff there. Neither the Fall River or Teton River predictions would set new records, but within the range of statistical uncertainty, we could certainly observe new records in both streams for early runoff. Table 2 also shows that the centers of mass in the ground-water dominated subwatersheds in the upper Henry's Fork are predicted to be 5–6 days *later* than average. This is because when the snowmelt component of these subwatersheds is low, as it will be in 2026, groundwater dominates the hydrograph, which pushes the center of mass later into the summer, away from the snowmelt peak. This is clearly shown by the 2015 hydrograph shown in Figure 6, in which the snowmelt peak occurred on April 1, leaving essentially a uniform, groundwater-fed hydrograph from then until the end of September. The balance point of a perfectly uniform flow over that period would be halfway through, on July 1, and this year's predictions aren't far off from that. This year's predicted center of mass in the Henry's Lake to Island Park subwatershed would be tied with 1961 and 1977 for third latest on record. The latest centers of mass were observed in 1992 (July 4) and 1959 (July 3).

__Table 2__. Predicted 2026 April–September hydrograph centers of mass.

	April 1 – September 30 natural flow center of mass			
Subwatershed	Prediction	1978-2000 ave.	2001-2025 ave.	2025 Observation
Henrys Lake	20-May	6-Jun	3-Jun	22-May
HL to Island Park	30-Jun	24-Jun	23-Jun	23-Jun
IP to Ashton	26-Jun	20-Jun	22-Jun	20-Jun
Upper HF (Ashton)	26-Jun	21-Jun	22-Jun	21-Jun
Fall River	11-Jun	17-Jun	15-Jun	9-Jun
Teton River	13-Jun	18-Jun	15-Jun	13-Jun
WATERSHED TOTAL	16-Jun	19-Jun	18-Jun	15-Jun

At the watershed scale, the peak of the natural hydrograph is expected to occur in late May, around 2–3 weeks earlier than average (Figure 7). Later in the summer, natural flow will be much lower than average and even lower than last year, although last year's natural flow generally sits within the statistical interval around this year's prediction, meaning that if the summer turns out to be cooler and wetter than average, late-summer natural flow this year will be similar to what it was last year.

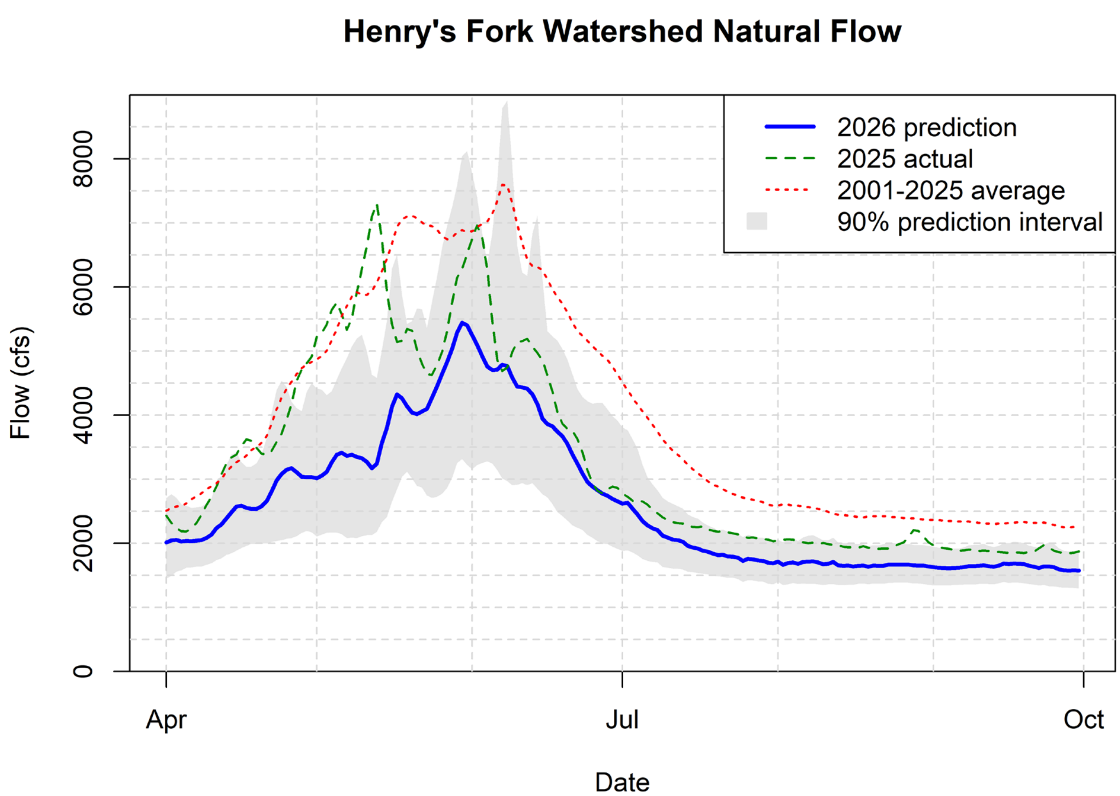

__Figure 7__. Predicted Henry's Fork watershed natural flow, with 2025 and the 2001–2025 average for reference.

Reservoir operations and regulated streamflow

At the current outflow of around 190 cfs, Island Park Reservoir will fill by May 8. In all 1000 simulations, the reservoir reached full pool at the end of the day on May 7. However, there were many simulations when resulting streamflow was not sufficient to meet statistically estimated diversion prior to then. For reference, the earliest draft date on record is May 27, set in 2007. A draft start date in early May is not inconsistent with the low water supply and early runoff we are experiencing this year, but I assumed that water managers and users in the watershed would make appropriate adjustments to prevent early reliance on reservoir draft.

More specifically, delivery through the Crosscut Canal could be required in April to meet irrigation demand on the Teton River prior to the Teton River streamflow peak in late May and assumed onset of exchange well pumping on June 1 (Figure 8). Otherwise, the onset of delivery through the Crosscut will occur in mid- to late-June, a little closer to normal. Need for Crosscut delivery will remain above-average for the remainder of the summer and could increase late in September if the exchange wells are turned off at that time. As I coded exchange pumping in the model, total pumping ranged from 30,000 ac-ft up to around 60,000 ac-ft, with an expectation of 37,615 ac-ft (Figure 9). The expected value is very similar to exchange pumping in other years of low water supply, including 1992, 2003, 2004, 2007, 2013, 2021, and 2022. This amount of pumping would meet roughly 15–25% of total diversion on the Teton River. Different timing of exchange pumping than the June 1 to September 15 window I used in the model could change the need for Crosscut delivery and hence need for Island Park Reservoir draft. This is another key operational feature that is likely to be implemented differently than I assumed in the model.

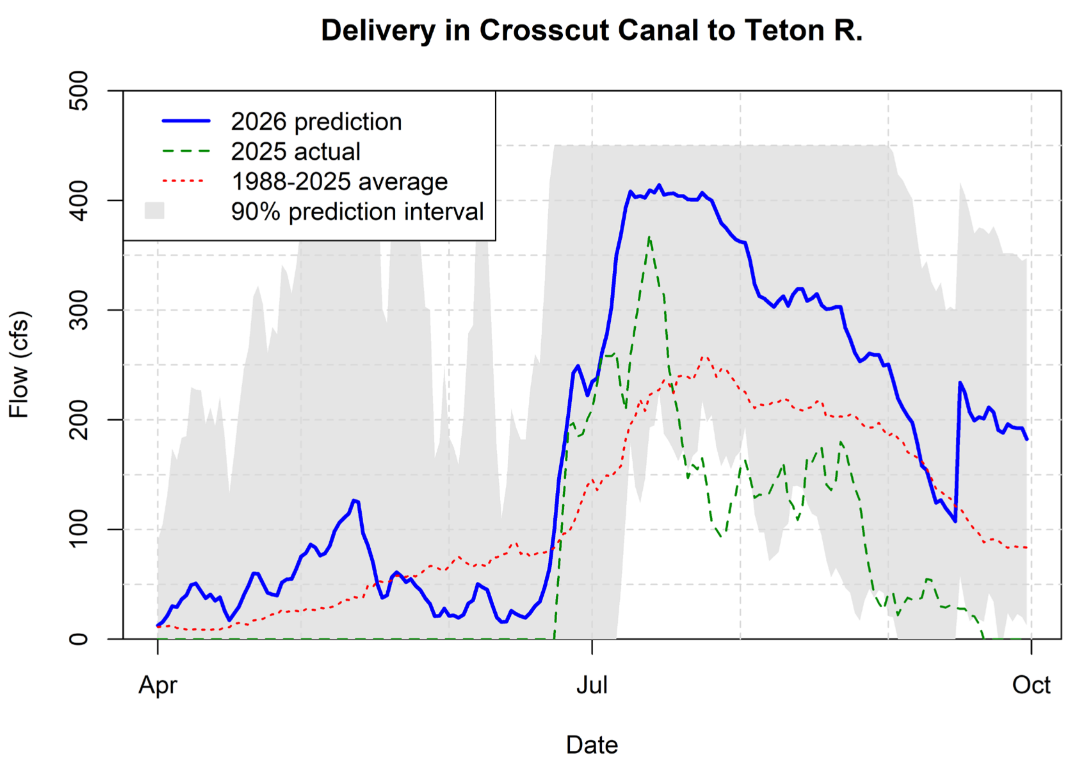

Figure 8. *Predicted Crosscut Canal delivery, with 2025 and the 2001–2025 average for reference.*

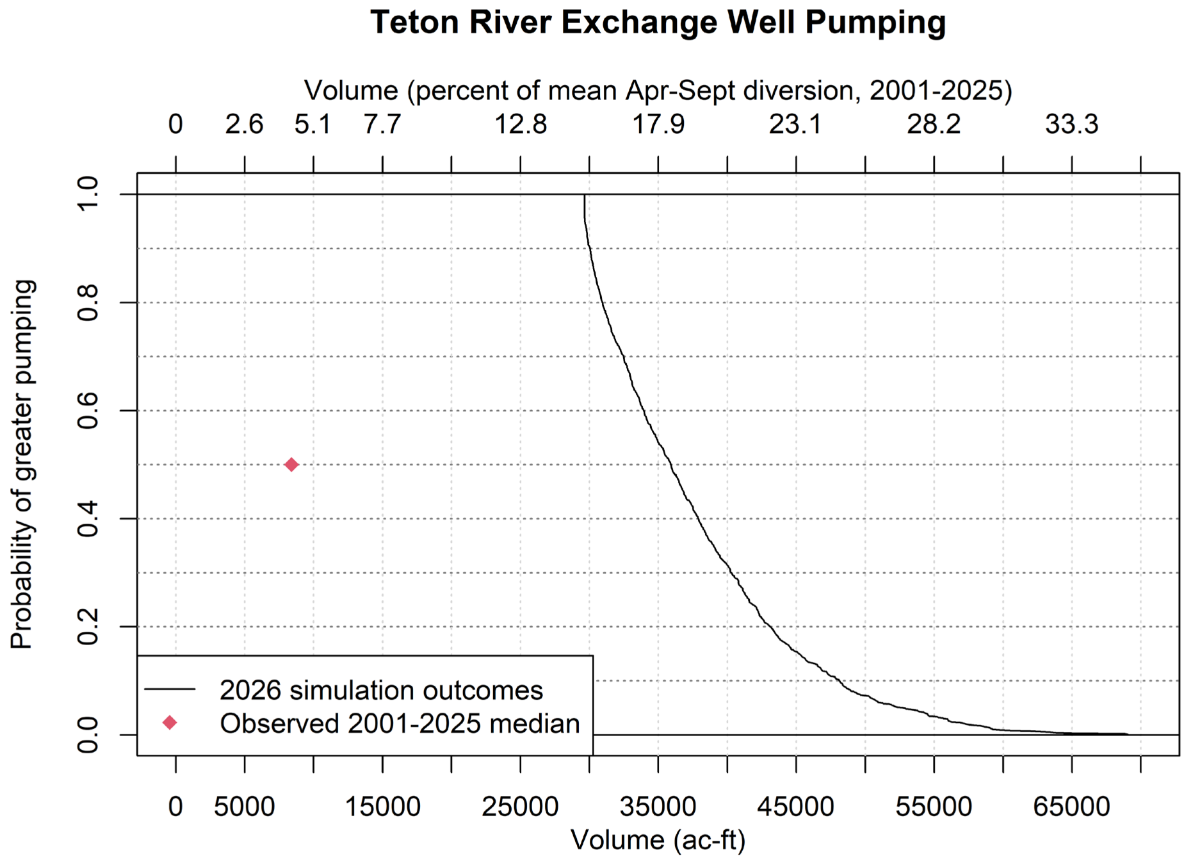

Figure 9*. Cumulative distribution function for Teton River exchange well pumping. The curve shows the probability of exceeding a given pumping volume. The secondary horizontal axis shows the fraction of total Teton River diversion met by exchange pumping.*

However, using my assumptions, in nearly 20% of the simulations, reservoir draft started on May 8, the day after the reservoir filled (Figure 10). In 50% of the 1000 simulations, reservoir draft started on or prior to June 9, 18 days earlier than the observed median draft start date of June 27 (Figure 11). There is only a 2% chance that reservoir draft will start July 1 or later. Island Park Reservoir outflow could reach 1,200 cfs by mid-June and is expected to peak at around 1,750 cfs in early July (Figure 12). There is an 18% chance that reservoir outflow could exceed 2,000 cfs (Figure 13). The need to send water out of the watershed to American Falls will likely require an increase in reservoir outflow on August 1.

Expected September-30 Island Park Reservoir volume was 12,279 ac-ft (9% full), which would rank 6th lowest in the reservoir's history, ahead of 2003, 1977, 1966, 1979, and 1992. Based on the tight statistical relationship between natural flow and September-30 reservoir volume, the natural-flow prediction produced an expectation of 6,723 ac-ft remaining in the reservoir at the end of September, so the individual reservoir simulations still show an improvement over that expectation, as has occurred in every year since 2018, due to improvements in infrastructure and water management. In only 7% of the simulations was September-30 reservoir volume at or greater than the long-term average of 62,000 ac-ft (46% full; Figure 14). In 75% of the simulations, the reservoir dropped to 2,000 ac-ft or lower by the end of September. The earliest date on which that occurred was July 20, but in most cases, the reservoir did not drop that low until mid-to-late August.

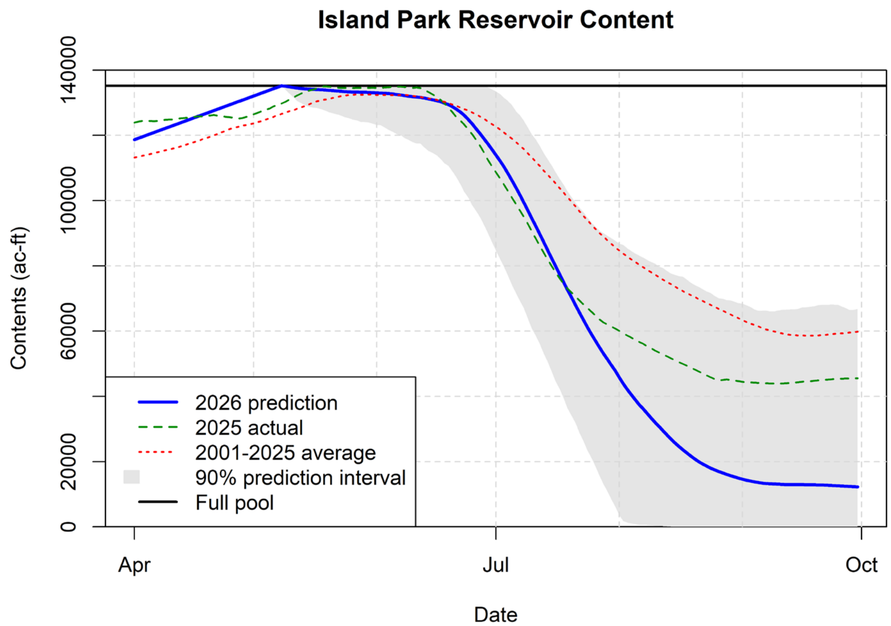

Figure 10. *Predicted Island Park Reservoir volume, with 2025 and the 2001–2025 average for reference.*

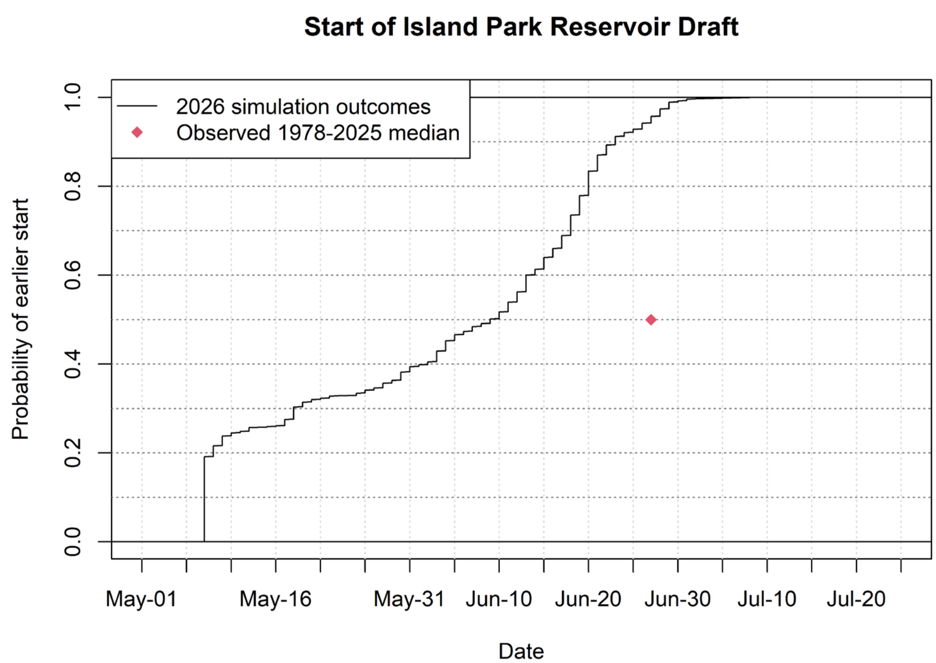

Figure 11. *Cumulative distribution function for start date of Island Park Reservoir draft. The curve shows the probability of an earlier draft date.*

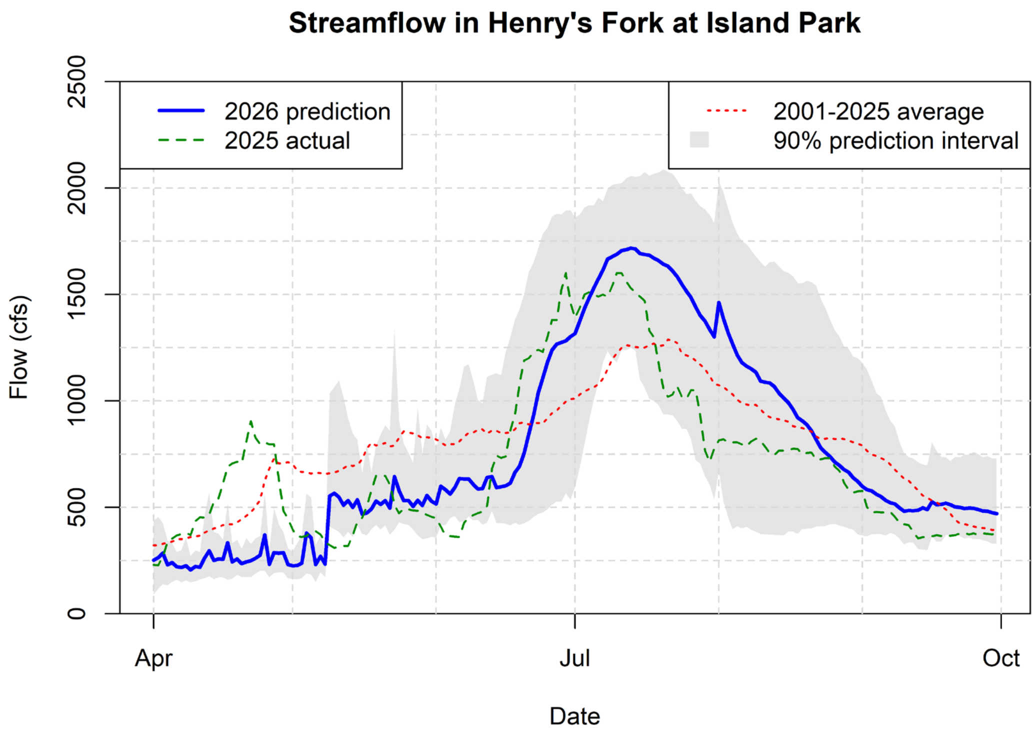

Figure 12. *Predicted Island Park Reservoir outflow, with 2025 and the 2001–2025 average for reference.*

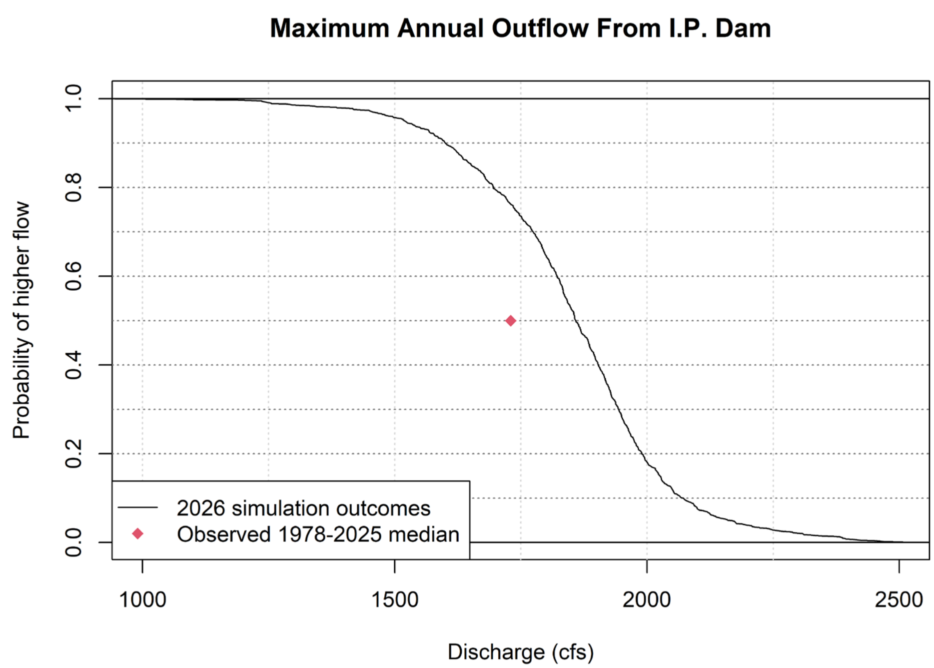

Figure 13. *Cumulative distribution function for peak outflow from Island Park Dam. The curve shows the probability of a higher outflow.*

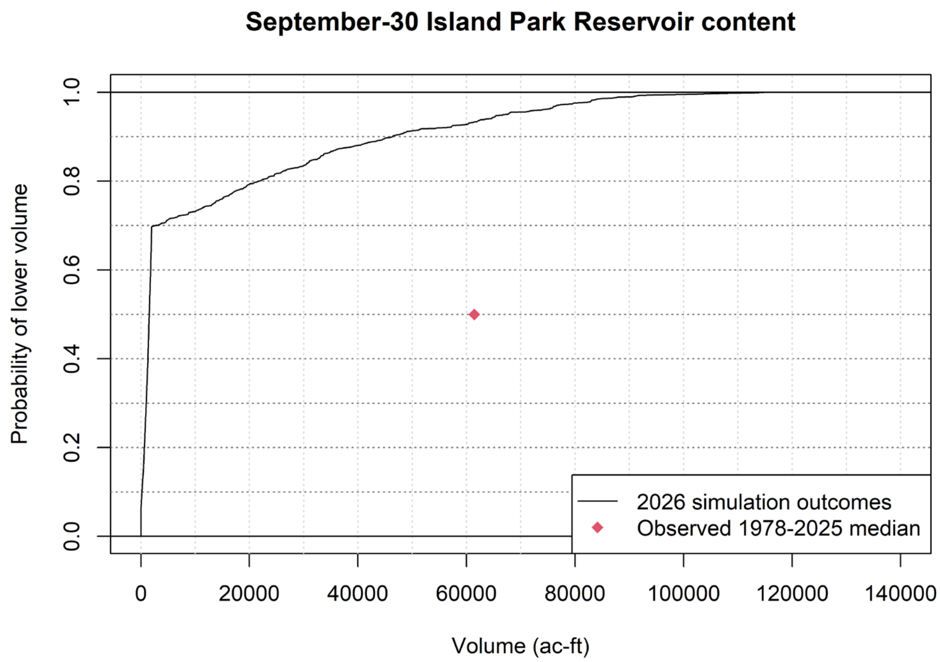

***Figure 14**. Cumulative distribution function for September-30 Island Park Reservoir content. The curve shows the probability of a lower volume.*

When the reservoir dropped below 2,000 ac-ft in the model, outflow was set equal to inflow, and diversion on the mainstem Henry's Fork was reduced as needed to meet the Parker streamflow target. On average, this required a reduction in late-summer diversion on the Henry's Fork of 300–500 cfs. That could include a reduction in delivery to the Teton River through the Crosscut Canal, but in the model I assumed it would occur at other points of diversion on the Henry's Fork. This is another point in the operations where decisions are likely to be made by water users and water managers that are different than what I instructed the computer simulations to do.

Grassy Lake volume dropped to its specified minimum of 7,000 ac-ft (46% full; Figure 15) in every simulation, which would be third lowest on record, ahead of 1977 and 2005. At the model-specified outflow of 80 cfs from June 1 to September 30, Henrys Lake dropped to 71,717 ac-ft (80% full; Figure 16) on September 30, which would rank 43rd in the 55-year record of daily lake levels, similar to its end-of-season level in 2007, 1981 and 2022.

Regulated streamflow in the lower Henry's Fork reached the target flow of 300 cfs as early as mid-April, and was at the target (300 cfs until July 31, 525 cfs thereafter) in all simulations from July 1 through the end of September (Figure 17). Regulated streamflow in Fall River downstream of all diversions dropped to the simulation-enforced minimum of 50 cfs as early as mid-June (Figure 18), and dropped to 50 cfs at some point in the summer in 88% of all simulations. On average, streamflow in Fall River downstream of all diversions was less than 100 cfs from July 6 through July 29, well below its mid-July average flow of around 300 cfs.

With the model assumptions and operational rules I used, physical water shortage late in the summer will require a reduction in watershed-wide diversion of around 36,500 ac-ft with a 50% probability and 87,000 ac-ft with a 20% probability. These reductions are relative to diversion that was estimated at only 94% of average to begin with and would result in total diversion around 83–89% of the 2001–2025 average. That is, even with very high reservoir draft and nearly 40,000 ac-ft of exchange well pumping, irrigators will still come up short of average by around 15%. As with most other hydrologic measures this year, total diversion in 2026 could easily be lowest on record, behind 2022.

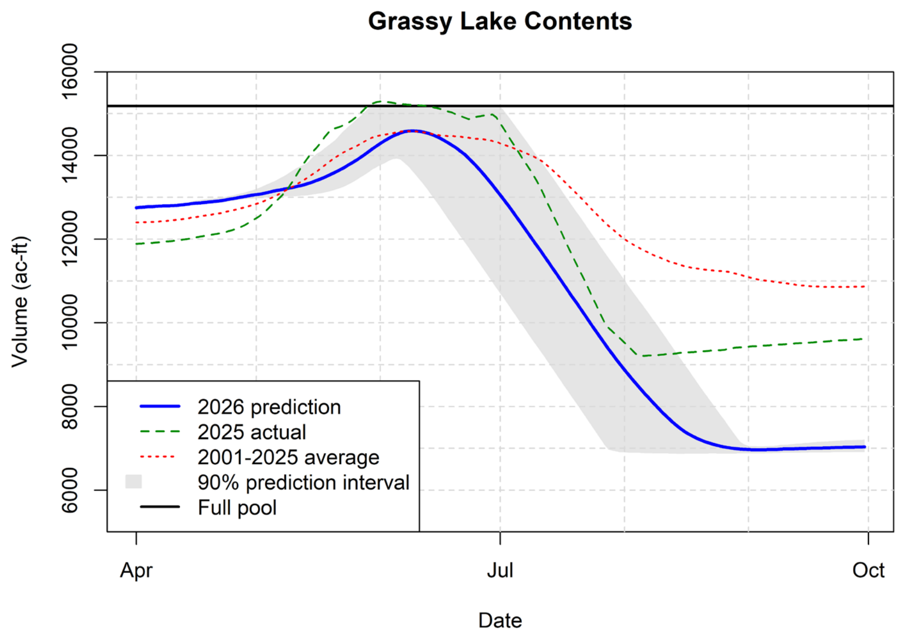

Figure 15. *Predicted Grassy Lake volume, with 2025 and the 2001–2025 average for reference.*

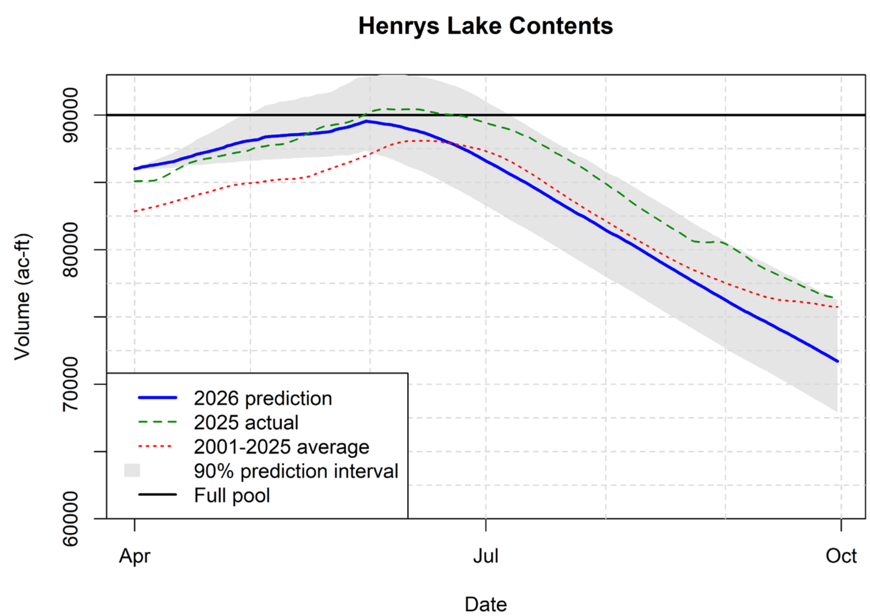

Figure 16. *Predicted Henrys Lake volume, with 2025 and the 2001–2025 average for reference.*

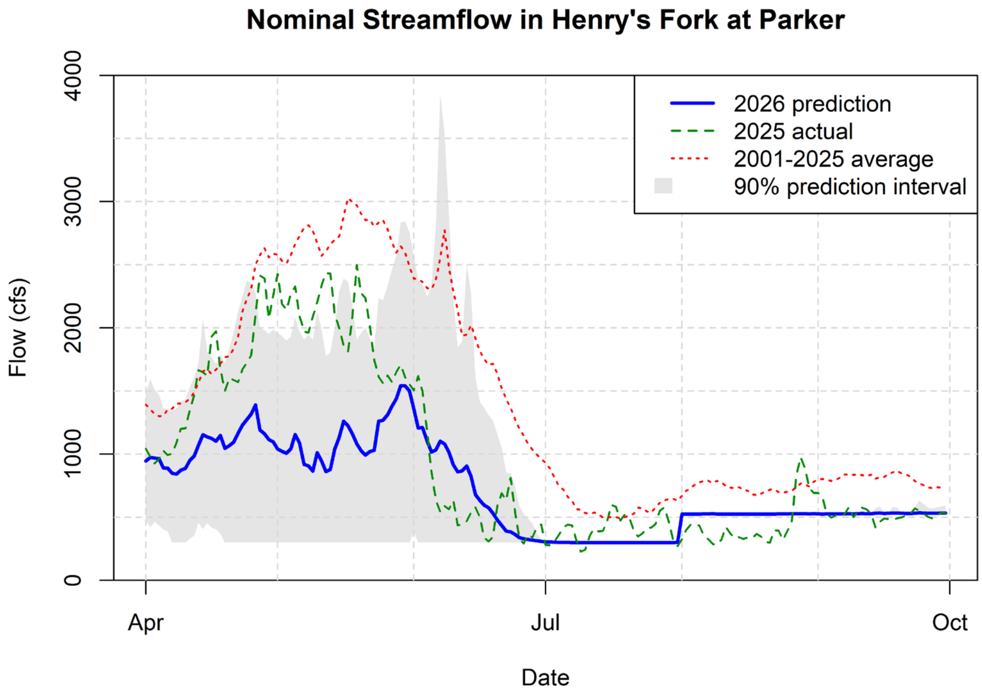

***Figure 17**. Predicted streamflow in Henry's Fork at Parker, with 2025 and the 2001–2025 average for reference.*

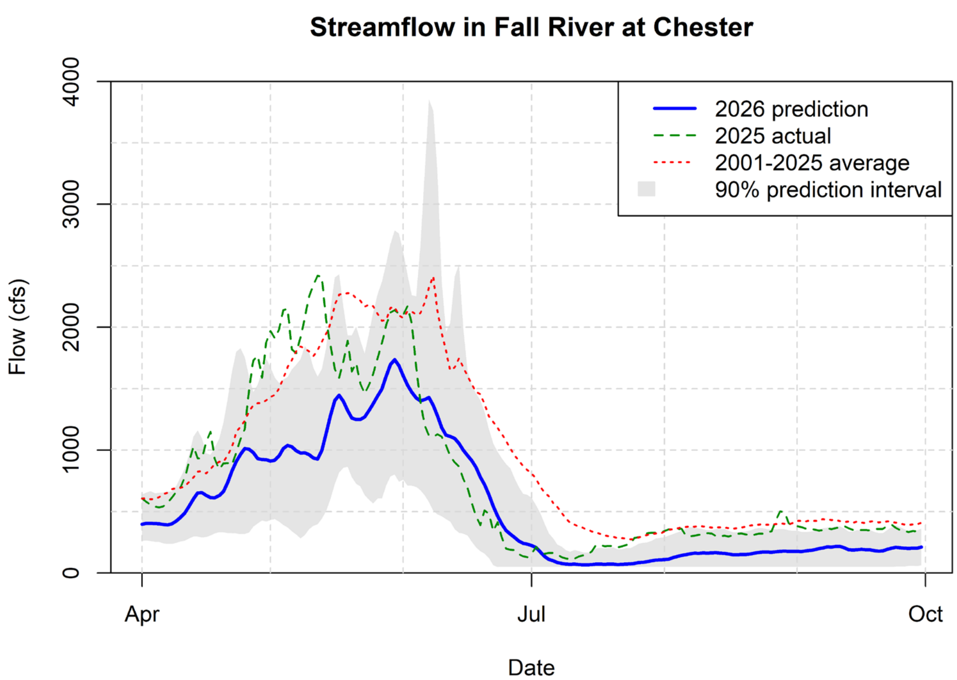

***Figure 18**. Predicted streamflow in Fall River at Chester, with 2025 and the 2001–2025 average for reference.*

Water quality

As detailed in the 2025 technical report, water temperature and turbidity have both been increasing over the past 12 years at the watershed scale, at 4% per year for turbidity and 0.16 degrees F per year for July–August water temperature. While statistically significant over the 12-year period and across multiple locations, the average annual increases are relatively small, highly dependent on spring and summer weather, and difficult to predict. So, all we can say about turbidity and mid-summer water temperature is that we expect them to continue to increase this summer at these incremental rates but can't provide accurate and precise predictions at any given location in the watershed.

However, we now have strong and precise statistical models that relate key water quality parameters at Island Park Dam to hydrologic and climatic factors that we can predict via the simulation model. Using the outputs of that simulation model as inputs to the statistical models, I have generated predictions of June 15 to September 30 turbidity and suspended sediment load and July 1 to August 31 water temperature at Island Park Dam (Figure 19). Water temperature and suspended sediment load are predicted to be slightly higher than we observed in 2025 and the highest on record since we started monitoring water quality in 2014. Turbidity is predicted to be slightly lower than observed last year, but including statistical uncertainty, there is about a 40% probability that turbidity this year will be highest on record.

Further, one of the most astounding observations from this past winter is the period of ice cover on Island Park Reservoir. Granted, our data set on this is short—we started carefully recording ice-off and ice-on dates only in water year 2015 (fall of 2014 through spring of 2015). Prior to this year, the average date of ice formation on Island Park Reservoir was November 14, and the average date of ice-off was April 30. That produced a 167-day average period of ice cover on the reservoir. This year, ice formation did not occur until December 4, and ice-off occurred on March 31, for an ice-covered period of only 117 days, 50 days shorter than normal. The previous record date for early ice-off was April 23, in 2015.

The shorter period of ice cover will allow algae growth in the reservoir to start 3–4 weeks earlier than average. That will result in the onset of high turbidity in reservoir outflow 3–4 weeks earlier than average. Last year, when water quality in the reservoir was the worst we have observed in 12 years of monitoring, high turbidity resulting from algae growth and decay started to appear in the reservoir around July 4 and in the river downstream on July 15. When combined with predicted early draft of Island Park Reservoir, we are likely to see both high outflow and high turbidity downstream of the dam by the middle of June.

Fish populations

Will we see fish kills?

I have already had people asking me whether the anticipated very low water supply will produce fish kills, as anglers have seen in some streams around the West in recent years. In the Henry's Fork itself, the answer is "no". The Henry's Fork is not conducive to fish kills, no matter how low the water supply is. By "fish kill" I mean a concentrated, observable mass die-off of fish due to lack of dissolved oxygen, warm water, or disease resulting from low streamflow and/or poor water quality. In reaches with water-limited carrying capacity for fish (discussed in more detail below), individuals are lost to natural mortality, predation, or emigration one fish at a time slowly over the course of the limiting time period. These are natural processes of mortality due to space limitations, not mass die-off due to acute conditions. Despite the gradual increase we have seen over the past decade in water temperatures, we have not seen either water temperatures or dissolved oxygen reach acute levels that would cause fish kills in the Henry's Fork. Further, all fish in the Henry's Fork and most tributaries have easy access to better habitat if they desire.

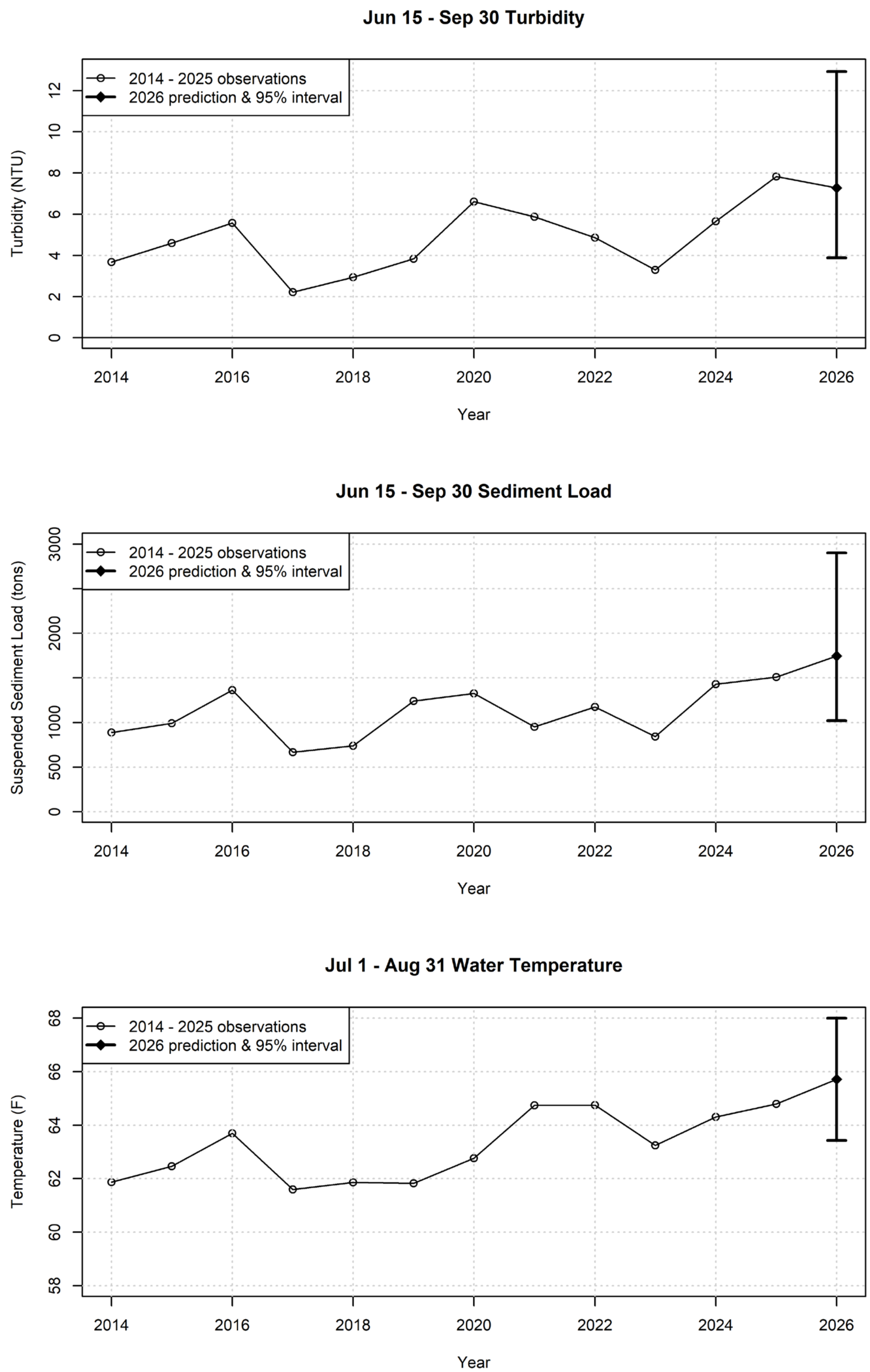

***Figure 19**. Summer water-quality parameters at Island Park Dam from 2014–2025, with the 2026 predictions and 95% prediction intervals.*

Lastly, the way the Henry's Fork is managed, the main river can't dry up. One reach of the North Fork Teton River will dry completely, but it does so every summer, so this year will not be any different. As mentioned above, lower Fall River streamflow will get very low this summer, possibly as low as 50 cfs. If streamflow drops relatively slowly in that reach, fish can move to better habitat, including the Henry's Fork upstream of Chester Dam, which they do every summer. If streamflow drops rapidly, some fish could be stranded, as we saw in 2016. Rapid drops in streamflow occur when diversion increases rapidly when natural flow is dropping rapidly from its snowmelt peak. This year, diversion is already going to be very high, and the drop in streamflow at the end of snowmelt will be relatively small because there is little snow to feed a high peak. So, I expect fish in lower Fall River to have time to migrate out of the reach. In the main Henry's Fork, groundwater inputs and delivery of irrigation water out of Henry's Lake maintain streamflow in the upper river no matter what. Irrigation delivery from Island Park Reservoir keeps plenty of water the river from the dam all the way to St. Anthony. Lower-watershed diversion needs, basin-wide needs, and groundwater returns mean that there is always enough water in the lower Henry's Fork throughout the summer to maintain fish and invertebrate habitat. In fact, in a year like 2026 when water will likely be delivered from Island Park Reservoir to American Falls, late-summer streamflow in the lower Henry's Fork may be higher than it is even in years of normal supply.

The specific effects of this year's low water supply in each reach of the Henry's Fork are discussed in the subsequent sections.

Island Park Reservoir and Henry's Fork upstream

All kokanee and most of the larger trout found seasonally in the upper Henry's Fork spend some of their lives in Island Park Reservoir. Hence, these populations are determined by the amount of suitable habitat in the reservoir. Although the exact amount of that habitat available is a function of the particular combination of dissolved oxygen and water temperature at any given location in the reservoir, we generally observe good kokanee runs when the reservoir stays above about 45% full for three consecutive years, given that most kokanee in the Henry's Fork spawn at age three. That was the case from 2019 through 2024, leading to better kokanee runs over that time period than any time since the 1990s. Although the 2025 kokanee run was still strong, Island Park Reservoir dropped to 33% full last year, and we expect to see that reflected in lower kokanee numbers this year and next. Further, with this year's carryover projected to be even lower, kokanee numbers will be low at least through 2029. The same thing generally applies to rainbow trout, although they have slightly better tolerances for higher water temperatures in the reservoir.

Island Park Dam to Riverside

The trout population in this river reach is determined by December–February streamflow in Box Canyon, with a 2-year delay between water supply and appearance of the trout in the fishable population as two-year olds. Winter flow has been well below average for five of the past six years, with the only exception being the winter of 2023/2024. The cohort of juvenile fish that experienced that winter are three years old, meaning that there will be a good number of 14–18-inch fish in the population this year. That cohort will persist in the population for another two years, providing decent numbers of 4- and 5-year old fish over the next two years, respectively. However, given low winter flow in 2025 and 2026 and very likely again in 2027, the population will remain low for at least three more years. Specifically, the effect of this year's low water supply won't be felt in the population until 2028 but will persist through 2030. The best-case scenario is that water supply will improve enough to have above-average winter flow in the winter of 2027/2028 to produce a good cohort of two-year old fish entering the population in 2029. However, two more good years of winter flow would be required to produce numbers of fish across all age classes, meaning that 2031 is the earliest we could expect to see that.

Riverside to St. Anthony

Trout populations in this river reach are stable and show no statistically detectable response to water supply one way or the other. We do not anticipate any short- or long-term effects of this year's drought on trout in this reach.

St. Anthony to North Fork Teton River

The trout population in this reach of river is limited by low streamflow in the summer. Because the river is managed every year to achieve the same irrigation-season target there, the only difference between streamflow in a dry year and a wet year is the duration of the low-flow period. On average, this period is coincident with the period of Island Park Reservoir draft, roughly from late June to mid-September. As mentioned above, this year that period is likely to last from May through July. Flows during August and September this year are ikely to be higher than average due to the need to send water to American Falls Reservoir. That potentially could allow migratory brown trout to move back into that reach earlier in the season than usual. In any case, flows in the lower Henry's Fork are not likely to be any lower than they are in any other year, so we do not expect any change in the trout population there.

Conclusions

The predictions of natural flow volume, timing, and hydrograph shape are likely to be as accurate as they have been in the past, generally around 10% from observed values. Predictions of record low streamflow—or close to it—are consistent with the April-1 hydrologic conditions: lowest April-1 SWE on record, one-year moisture at its lowest point in five years, and three-year precipitation at its lowest in nearly three years.

The predictions for irrigation and reservoir management are based on strict operational rules I hard-coded into the computer model in an attempt to maximize delivery of irrigation water to users in the Henry's Fork and send roughly 20,000 ac-ft of water out of the watershed to American Falls Reservoir. I have identified several places where decisions on the part of water users and water managers will no doubt differ from what I told the computer to do, so the actual numbers will certainly differ from the results presented here. However, the fact that even my hard-coded operational model outputs—reservoir volumes, exchange well pumping, and diversion rates—are comparable to those observed in previous dry years such as 1977, 2003, 2007, and 2022 indicate that the model is providing realistic output consistent with previous years and is useful in preparing watershed stakeholders for what is in store.

In terms of water quality, we can expect another year of high water temperatures and high turbidity downstream of Island Park Dam. Water quality is governed first and foremost by water supply. When water supply is high, water quality is good, regardless of other factors. When water supply is low, then factors such as air temperatures, wind, increased nutrient concentrations in the reservoir, cycles of algae growth and decay, wake boats, reservoir volume, and power plant operations all play a role in degraded water quality. HFF's DIRTT plan includes science-based infrastructure, management, and restoration projects that will improve water quality without relying solely on good water years to come along once in a while. However, all of those projects are expensive and will take many years to design, plan, and implement. In the meantime, we can expect poor water quality in years when water supply is low.

This year's low water supply will no doubt affect fishing conditions watershed-wide this season, through streamflow and water quality. However, the effects of this year's low water supply on fish populations will be limited primarily to the two river reaches immediately upstream and downstream of Island Park Reservoir, and even then the effects will not be felt for 2–3 years.

We are very likely to experience the lowest spring and summer water supply of the last 49 years, if not the last 93 years. The unknown is whether this year is an anomaly that won't come around again for another 93 years or whether it will become the new normal.